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STRAINED TENDONS AND THEIR TREATMENT BY FIRING

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Strained tendons occur in thoroughbred horses in training and in hunters as the result of inability of the tendons to stand up to the tension set up when the fetlock joint is fully extended in taking the animal's weight at the end of one pace or propelling him forward at the commencement of another. Factors to be taken into consideration are the animal's general health and fitness, the weight he is carrying, his conformation and the state of the ground. Strains are more liable to occur in unfit horses than in those that are fit, in tired horses than in fresh animals and on soft going than when the ground is hard. Strains occur frequently during jumping—usually on landing, but especially when the animal has made a faulty jump and lands awkwardly so that he has to make some extra effort to recover himself. In these circumstances landing in soft ground is especially dangerous.

When the tension in a jumping or galloping horse's tendon becomes too great the tissues give way. Tissue fluids leak into the tear causing a soft swelling and the part becomes painful and hot. The strain usually occurs in the flexor tendons or in the suspensory ligament in a foreleg between the knee and the fetlock joint.

Healing takes place by the natural process of inflammation. The inflammatory condition which began with the leakage of tissue fluids continues by forming a network of blood vessels and fibres throughout the swelling. The heat felt in the area is due to this increased circulation and a strain cannot be considered cured while any heat remains.

When the blood vessels and fibres have penetrated the whole swelling, the blood supply decreases and the fibres shrink, forming scar tissue which contracts the swelling and gives strong support. Eventually the leg becomes fine again with a hard lump at the site of the breakdown and this may throw the back line of the tendon out of the true, causing a "bowed tendon." In cases of more severe or repeated strain the whole length of the tendons may be involved, causing a diffuse thickening.

Treatment is primarily intended to soothe and support the part and to limit the size of the soft swelling and it is effected by fomenting, poulticing and bandaging. Later treatment consists of stimulation of the area to induce the laying down of more fibrous tissue by the process of inflammation. This stimulation is brought about with liniments, blistering ointments and by firing. The natural healing processes are thus hastened and their effects exaggerated; the animal is lame for a shorter period and the leg is supported strongly to withstand the tension of further work.

It is important to realise that when a tendon has been strained the horse will avoid using the affected leg as much as possible. This means that the opposite leg is constantly carrying extra weight with the result that its tissues may become strained or laminitis may occur. Every consideration should, therefore, be given to the sound leg, and when stimulant treatment is adopted, both legs should be dealt with equally.

There is an enormous number of preparations available for the treatment of strained tendons. Antiphlogistine and white lotion are useful as soothing applications; while firing, followed by a cantharidin blister, is the most drastic and most effective of the stimulants. Many cases answer to milder treatments, but if these fail, firing and blistering may be superimposed.

PREPARATION FOR FIRING

There should be no undue haste about firing a horse after he has broken down. For the first few days after a strain has occurred the leg is kept in Antiphlogistine poultices changed every twelve hours. After the acute heat and pain have subsided swabs soaked in white lotion are bandaged on to the leg or the leg may be plastered in cold kaolin paste. The good leg should be supported by bandaging.

Meanwhile as the horse was probably full of corn at the time of the accident, he must be let down until his system is thoroughly cooled. The leg needs to be comparatively cold and hard before it is fired, and a preliminary blistering may be necessary further to reduce the filling. Colts should be castrated, unless there are strong reasons for keeping them entire, to gain the advantage of the lighter body carried by geldings. It is impossible to lay down the length of time to be allowed between the occurrence of a breakdown and the operation of firing, but six weeks is probably the minimum period. Both legs should be fired and in the event of a preliminary blistering both legs should be blistered. This has the effect of strengthening the sound leg which has had to bear more than its usual share of weight, while the other leg has been rested; it also encourages the animal to bear evenly on both legs during treatment and prevents him doing most of his work on the good leg when he goes back into training.

The firing operation may be performed with the animal in the standing position with the legs desensitised by a local anaesthetic, or with the animal cast and chloroformed. Unless he is refractory the standing position is to be preferred as it is less distressing to the horse, and this method of operating is the one described.

Technique of Firing

The hair is clipped from around the fetlock joint and up the back and sides of the leg to behind the knee, and the whole of this area is swabbed with tincture of iodine. Local anaesthetic (Chlorocain) is then injected under the skin as follows : 4 c.c. at the top of each groove between the tendons and the splint bones and 2 c.c. over the tendons half way between these two points ; and similar amounts at three corresponding points five inches lower. The other limb is then treated similarly. Within 10 to 15 minutes the area from which the hair was clipped should be insensitive to needle pricks. An injection of 1 c.c. is made slightly above any spot that is found to be sensitive. When the whole area is satisfactorily numbed, firing is proceeded with according to the method and pattern decided upon.

In most cases control by a twitch is required while the injections are being made into the legs. After this the operation can usually be completed with no more control than that supplied by a bridle if a groom takes the horse's attention with an armful of hay, though a twitch may be required.

Three methods of firing are commonly used : line firing, point firing and pin firing. The irons are used at a bright red heat.

In line firing, lines are drawn horizontally one-third to one-half of an inch apart. The series of lines commences well up under the knee and continues over the fetlock joint. Laterally the lines extend over the suspensory ligament to the cannon bone, and in the region of the fetlock joint they may be continued to the front to form a series of rings around the joint. When these lines have been lightly marked out they are gone over until the grooves nearly sever the skin. Three or four applications of the irons are usually sufficient, depending on their heat, the pressure applied and the thickness of the skin. The correct depth is indicated by the appearance of beads of lymph at the bottom of the grooves.

In point firing, round-pointed irons are used with which a row of marks, half an inch or more apart, is made down the back of the tendons, three or four further rows being made on either side. The marks of one row are placed opposite the gaps in the adjoining row. Several short rows may be made to extend over the sides and to the front of the fetlock joints. The marks are made of such a depth that a small but definite hole at the bottom of each is seen actually to pierce the skin. These two methods can be combined by point firing between the marks made by the line firing irons.

In pin firing, a pointed copper pin carried by the iron is driven a quarter of an inch through the skin, the marks being made one-third of an inch apart. Five or six rows on each side of the middle line may be fitted in before the cannon bone is reached. One application of the iron is sufficient at each mark. Although the marks can scarcely be seen at the time they are made, they show eventually as distinct and permanent scars.

When the firing has been completed, a cantharidin blister is rubbed in for three or four minutes. As blistering ointments vary in strength, a rough guide is that a blister should be rubbed in after firing for half the time required to produce a good reaction on an unfired leg. Vaseline is thickly smeared in the heels and a pad of cotton wool is bandaged in place around the pasterns. This prevents the blister running down and causing cracked heels. The heel dressings are changed the day after the operation and are dispensed with the following day. The legs fill considerably, the filling extending in 48 hours to above the knees and subsiding gradually during the following week.

Criticisms of the various methods are that line firing, by dividing the skin into strips, may interfere with the circulation, causing sloughing of the skin : pin firing, by penetrating into the deeper tissues, punctures the tendon sheaths and may release synovial fluid or cause infection of the sheaths. The inflammatory reaction following the blistering may be depended upon to check the synovial flow and overcome any infection. Point firing involves the same risks to a less degree. In practice pin firing seems to give the most definite reaction and the most satisfactory results.

Treatment after Firing

After firing and blistering the horse is tied up on two head ropes for 48 hours. He can then be loosed with side reins applied, or preferably a neck cradle, and he may be relieved of even this control in about a fortnight. The legs are dabbed over the fired area on the third day with white lotion and dusted with antiseptic dusting powder. This is continued daily until the scale is quite dry and is beginning to drop off. If loosed too soon the animal may bite or rub pieces of scale or skin off his legs while they are healing. If this does occur the places are treated as open wounds with B.I.P.P. ointment and later with the white lotion and powder. Uneven scarring may be caused in this way but the effect of the firing is not reduced.

The animal is led out on the third day for a few minutes and for two quarter-hour periods on the fourth day. Exercise is then gradually increased, but the horse should not be trotted for at least three weeks and he should not be put into full work for six months or longer. It is an advantage if he can be turned out to grass for a few months when the scale has fallen off his legs, that is to say, about a month after the operation of firing.

Cases

The success or failure of the treatment may be judged by the ability of the patient to perform efficient work again. The following notes of cases comprise all the thoroughbred horses fired over the tendons of both forelegs by the writer in the two-year period, May 1st, 1936 to April 30th, 1938. In these cases, each animal's performance is recorded in the form book and has been noted up to the end of April, 1939.

1. Bay gelding (1930) by Tetratema. Strained the off fore tendons on March 30th, 1936. Line fired and blistered on May 6th, 1936. He ran 18 months after being fired (November 9th, 1937) and was third. He ran once more in 1937 and six times in 1938.

2. Chestnut gelding (1930) by Gainsborough. Strained the off fore tendons racing on May 25th, 1936, and was line fired and blistered on June 25th, 1936. He ran six months after being fired (December 29th, 1936) and appeared in ten races in 1938 and in one more up to April, 1939.

3. Bay mare (1932) by Nothing Venture. Strained the near fore tendons racing on August 26th, 1936. Line fired and blistered on September 15th, 1936, and has not raced since. Now at stud.

4. Grey gelding (1932) by Abbots Trace. Developed signs of tendon trouble in training and was line fired and blistered on May 30th, 1936. He raced seven months after being fired (December 18th, 1936). He ran once more in 1936 and won. Up to April, 1939, he had run in ten more races, winning two of them and being placed second twice and third once.

5. Bay colt (1934) by Norwest. Strained the near fore suspensory ligament racing on the flat on August 12th, 1936. Line fired and blistered on October 7th, 1936. He ran again on April 14th, 1937, six months after being fired. He ran four more times in April and May and broke down again on May 29th, 1937. He was point fired on September 26th, 1937, but did not race again and was shot.

6. Brown gelding (1932) by Black Gauntlet. Strained the near fore tendons in training and was line fired and blistered on September 15th, 1936. He raced on December 1st, 1937, 14 months after being fired. He ran twice more in 1937 being second in one race and he ran six times in 1938, winning twice.

7. Bay gelding (1931) by Invershin. Strained the tendons and suspensory ligament of the off fore leg on October 22nd, 1936. Line fired and blistered on January 25th, 1937, and he raced again on November 27th, 1937, ten months after being fired. He ran twice more in 1937, ten times in 1938 and five times in 1939 up to April. He won two of these races and was placed second four times, third four times and fourth once.

8. Chestnut gelding (1928) by Brave Chap. Strained the perforatus tendon of the off foreleg racing on November 4th, 1936. Line and point fired and blistered on January 27th, 1937, but broke down again on August 31st, 1937, and was shot.

9. Brown gelding (1933) by Knight of the Garter. Overreached in training on December 5th, 1936, completely severing the perforatus tendon of the near fore leg. Line fired and blistered on February 16th, 1937. He ran on December 15th, 1937, ten months after being fired. He ran 19 times more up to April, 1939, winning once and being placed second twice, third twice and fourth once.

10. Bay gelding (1929) by Defiance. Strained the near fore tendons on December 16th, 1936. Line and point fired and blistered on March 24th, 1937, but broke down again in training and was shot.

11. Bay gelding (1930) by Sun Yat Sen. Strained the off fore tendons racing on December 3rd, 1936. Line fired and blistered on March 25th, 1937. Raced eight months after being fired (December 2nd, 1937) and has run seven times more up to April, 1939, being placed first, second, third and fourth each on one occasion.

12. Chestnut gelding (1931) by Catalin. Strained the suspensory ligaments of the near fore leg in training early in 1937. Line and point fired and blistered on March 25th, 1937. He ran on November 10th, 1937, ten months after being fired and up to April, 1939, had run in 20 more races, winning two and being placed second three times and fourth once.

13. Bay gelding (1931) by Spion Kop. Strained the tendons of both fore legs in training early in 1937. Line and point fired and blistered on April 9th, 1937. He raced eight months after being fired (December 16th, 1937) and up to April, 1939, had run 16 times more, winning one race, being second four times and fourth once.

14. Brown gelding (1928) by Martin Lightfoot. Strained the off fore tendons in training early in 1937. Line and point fired and blistered on April 12th, 1937. He has not been in training since, but has been regularly hunted.

15. Chestnut gelding (1927) by My Prince. Broke down in training early in 1937. Line and point fired and blistered on April 13th, 1937, after being blistered on February 11th, 1937. He ran on December 2nd, 1938, 20 months after being fired and was killed in a race later in the same month.

16. Bay gelding (1930) by Guido Reni. Strained the off fore suspensory ligament racing on December 30th, 1936. Line and point fired and blistered on April 24th, 1937. He raced again eight months after being fired (December 4th, 1937) and up to April, 1939, had run 16 times more, winning two races and being placed second once, third twice and fourth three times.

17. Bay gelding (1929) by Santorb. Broke down in training early in 1937 on the near fore tendons. Line and point fired and blistered on April 26th, 1937. He was not considered worth training further and has been turned out.

18. Chestnut gelding (1930) by Hurry On. Line and point fired and blistered on August 18th, 1937, after his forelegs had given considerable trouble for over twelve months. He ran 14 months after being fired (October 15th, 1938) and three times more before the end of the year. He ran three times in 1939, was third once and was killed in an accident racing.

19. Chestnut gelding (1934) by Artist's Proof. Broke down racing on June 22nd, 1937, on the near fore tendons and suspensory ligament. Line fired and blistered on November 1st, 1937. He was in training in April, 1939, and has raced since.

20. Bay colt (1933) by Gainsborough. Strained the off fore tendons and suspensory ligament on May 25th, 1937. Line and point fired and blistered on November 2nd, 1937. He had not run up to April, 1939.

21. Bay colt (1932) by Trigo. Strained the near fore tendons racing on August 11th, 1937 and was line fired and blistered on November 3rd, 1937. He raced on October 29th, 1938, after an interval of eleven months.

22. Bay colt (1934) by Schiavoni. Strained the off fore tendons and suspensory ligament racing on November 23rd, 1937. Line fired and blistered on January 7th, 1938, and ran again on October 29th, 1938, after an interval of nine months.

23. Chestnut colt (1933) by Caerleon. Strained the off fore tendons racing on August 23rd, 1937. Line fired and blistered on April 27th, 1938, and pin fired and blistered on January 27th, 1938, as the line firing did not result in a satisfactorily cool leg. He ran after seven months on November 28th, 1938, and was fourth. He raced once more in 1938, and seven times in 1939 up to April, winning four races and being placed second twice and fourth once.

24. Bay colt (1932) by Rialto. Strained the suspensory ligament of the near fore leg in training late in 1937. Pin fired and blistered on February 14th, 1938, after being castrated on January 17th, 1938. He raced ten months after being fired (December 6th, 1938).

25. Bay gelding (1933) by Coronach. Strained the near fore tendons in training late in 1937. Pin fired and blistered February 1st, 1938. He raced eight months after being fired (November 2nd, 1938), and was third in a race in 1939.

26. Bay gelding (1932) by Highborn II. Strained the off fore tendons in training early in 1938. Line and point fired and blistered on March 2nd, 1938. Raced seven months later (October 11th, 1938) and twice more in 1938, being placed fourth once.

27. Bay gelding (1930) by Jackdaw. Strained the near fore tendons in training in the summer of 1935. Blistered October 1st, 1935. He ran 14 times in 1936, winning two races and being placed second four times, third once and fourth once. He ran seven times in 1937 and strained the near fore tendons again. He was line fired and blistered on February 24th, 1938, but was not considered fit to train further and was shot.

28. Bay gelding (1933) by Vatout. Strained the off fore tendons on March 14th, 1938. Pin fired and blistered on April 1st, 1938. Developed a wasting disease in the autumn of 1938, and was shot early in 1939 affected with miliary tuberculosis.

29. Bay gelding (1927) by Corn Kale. Strained the near fore tendons winning a race on February 10th, 1938. Line fired and blistered on April 5th, 1938. Raced again six months after being fired (September 28th, 1938) being placed fourth. He ran twice more in 1938 being third

on each occasion and he ran six times in 1939, winning one race and being placed fourth twice. He was killed in an accident racing.

30. Bay gelding (1929) by Ponteland. Strained the off fore tendons in training early in 1938. Line and point fired and blistered on April 26th, 1938. He raced seven months later (November 14th, 1938), being second, and he ran in four more races up to April, 1939.

31. Chestnut colt (1935) by Coronach. Strained the off fore tendons racing on May 28th, 1938. Pin fired and blistered on October 3rd, 1938. Was in training in April, 1939.

It will be seen that of the 31 animals treated, 21 have actually raced again (eleven were winners), three were in training (though one of these contracted tuberculosis and was shot) and one has been regularly hunted. Of the six which remain, two broke down again and were shot, one went to stud and three, for one reason or another, were not found fit to continue in training.

Summary

The technique of the operation for the treatment of strained tendons in race-horses by firing and blistering under local anaesthesia is described and 31 cases are recorded with notes on the animals' subsequent performance.

A Gas-Forming and Proteolytic Variant of *Str. agalactiae*

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and

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In the course of mastitis investigations we have encountered strains of *Str. agalactiae* which, when freshly isolated, exhibited all the biochemical and cultural characteristics of *Str. agalactiae*[1, 2], except that vigorous gas production and apparent proteolysis were observed in the yeast litmus milk medium. The cultures were obtained from Edwards' medium[3] or a non-inhibitory medium such as aesculin milk agar or aesculin blood agar (Edwards' medium less crystal violet[3]) by transferring suspected colonies into yeast dextrose litmus milk[4] or aesculin yeast litmus milk[5]. Microscopic examination of these cultures and streaking on various media failed to reveal the presence of any organism other than the characteristic chains and colonies of *Str. agalactiae*. All catalase tests were negative[2] and sub-cultures in the same medium behaved as normal *Str. agalactiae*, *i.e.*, acid and clot in 24 or 48 hours at 37° C. with little or no reduction of the litmus and complete absence of gas production and proteolysis. It may be assumed that these are temporary characteristics of the isolated cultures. Similar phenomena have been reported by Orla-Jensen[6] and were observed by one of us (J.G.D.) in 1935 for strains of *Str. cremoris* freshly isolated from cheese[7]. One factor in the production of gas may be the presence of certain substances in the medium which specifically stimulate gas production by bacteria. Thus it has been shown that clover and lucerne may contain substances specifically stimulating gas production by certain streptococci[8].

This note is published as a warning to investigators using our simplified confirmatory methods [2, 5, 9] not to reject litmus milk cultures showing gas formation and proteolysis if otherwise normal characteristics are obtained.

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[6] Orla-Jensen. (1919.) "The lactic acid bacteria," Copenhagen.
[7] Davis. (1935.) *J. Dairy Res.* **6.** 175.
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THE VETERINARY RECORD
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EMERGENCY MEASURES

OWING to the situation which has arisen during the last fortnight it has been decided to decentralise much of the work of the National Veterinary Medical Association, also of the National A.R.P. for Animals Committee, from 36 and 37, Gordon Square, W.C.1, respectively, in order materially to reduce the number of persons working in these adjacent premises. Forthcoming meetings of the Association, including the Annual General Meeting, have been adjourned, but it is hoped that normal meetings will be resumed at an early date, possibly at a centre other than London. Communications should continue to be sent to Gordon Square, arrangements having been made for the post to be dealt with there, and members are requested to bear with us over any inevitable delays in the transaction of Association (including *Record*) and N.A.R.P.A.C. business, such as are inseparable from the present hold-up in the postal services. So far as this journal is concerned, every endeavour will be made to continue its production and delivery with the minimum of delay, but here again under existing circumstances we would ask leniency from our readers inasmuch as the production, printing and despatch of the *Record* is necessarily affected by the number and duration of air raids, not only in the areas primarily concerned, but in others with which communication is desired.

Members will learn with much regret that a number of veterinary surgeons' premises have been demolished, so that they themselves are rendered homeless. We extend our sympathy to these practitioners and are authorised to assure them that the Association will do all in its power to ameliorate the unfortunate position in which they find themselves through no fault of their own.

Stop Press : At the time of going to press all residents in Gordon Square have been temporarily compulsorily evacuated ; *so far* no serious damage has been sustained by either Nos. 36 or 37, but the wisdom of the decision to decentralise has been amply justified. It is hoped to make emergency arrangements with the postal authori'ies to divert mail.

CLINICAL COMMUNICATION

Tuberculosis in a Horse

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Subject and History.—The subject of this case was a six-year-old thoroughbred bay gelding bought in France in November, 1937. He ran four times in 1938, under National Hunt Rules, and was second once and third once.

Early in 1939, the horse was doing light work but was not building up as he was expected to do. On February 23rd, he went slightly lame on the off-fore leg while exercising on the downs. On the way home, he became acutely lame, staggering about and falling over six times in half an hour. During this period the horse frequently raised the off-fore leg high in the air with the knee, fetlock and pastern joints fully extended and the foot above the level of the shoulder.

Examination.—The animal was seen by the writer about 40 minutes after the first attack by which time he seemed quiet and was able to walk home, about a mile, quite sound. On examination in his box he showed a temperature of 104° F., and was slightly distressed. The heart beats were accelerated and the heart sounds toxic, the two sounds resembling each other closely. The droppings were rather firm.

Diagnosis, Treatment and Course.—A cautious diagnosis of entero-toxaemia was advanced and the more obvious symptoms treated.

The horse became very anaemic and was treated with tonics and stimulants as well as with febrifuges and laxatives. The animal's appetite remained fair throughout and he was given grass and milk as well as dry feeds and hay. In spite of this he lost condition. The temperature remained at 102° to 103° F., while the heart beat and heart sounds returned nearly to normal. Oedematous swellings appeared on the belly and on the hind legs and remained in spite of treatment. A pimply eruption broke out on the inside of the hind legs and on the neck.

There was no recurrence of the nervous affection of the off-fore leg and this limb did not show any abnormality.

The horse did not lie down until the night of March 15th (three weeks after the violent scene at exercise) when he became very excitable, went down as if suffering from colic and began to knock himself about. He was shot early on March 16th.

Post-mortem Examination.—This showed a slight enteritis throughout the intestine. All the other organs, including the brain and the cervical region, appeared normal on superficial inspection with the exception of the liver and the lungs.

The liver showed nine or ten areas in which there was a focus of white and apparently caseous material surrounded by a zone of cirrhosis. These lesions were 3·5 cm. in diameter, the central focus being about 1 cm. across. All these areas were superficial and they were depressed in their centres. Throughout the liver and the lungs there were diffusely scattered a very large number of tubercles all about 3 mm. in diameter—a condition of acute miliary tuberculosis. Acid-fast organisms were demonstrated in the major lesions in the liver but not in the multiple small lesions in the liver and the lungs.

The large liver lesions were probably examples of isolated dissemination from an undetected primary focus in the alimentary tract. An explanation of the case may be that one of the large tuberculous lesions broke into the portal circulation on February 23rd, giving rise to immediate violent symptoms and, in the liver tissue and lungs, to metastases which had grown to 3 mm. by March 15th.

REVIEW

["**DRIVE THE DEAD LEAVES.**" A Novel by R. G. NETTELL. (Sampson Low, Marston & Co., Ltd.) Price 7s. 6d.]

The aim of fiction, it has been taught, is to please, and not to instruct; instruction when it is introduced, so it has been understood, must always be judiciously subordinated to the theme which gives normal human beings the most arresting sensations. And this theme, the basis of which we need not, in a review written for this journal, conceal from motives of affected delicacy is, in the light of the researches of modern psychologists, a sexual one, and of this kind usually an erotic one, or in the "thriller," a sadistic one. Suffice it to say that, in the mind of the reviewer, the author of this novel has conformed in ample measure to the preceding canons of fiction writing. For the conveyance of certain forms of instruction to the inexpert reader, however, it has been contended that the novel may be used in the hands of a scrupulously well-informed and judicious writer as an admirable medium of expression. Recently, one of the most distinguished of English contemporary historians (Sir John Marriott) has written a book in which he gives high praise to the historical novel. The points which commend it are that, in contradistinction to the more recondite treatises written by academic workers and researchers the novel makes easy reading, and, moreover, makes an attempt at portraying the lives of the common men and women of a given period rather than those of the noted or notorious, records concerning whom only come into the hands of the scholar on the subject.

Having stated this much in the way of preamble, we have no hesitation in commending the book under review, not only to members of our own profession, but also to the large British public. We would urge the reader, if he be a practised and, therefore, rapid novel reader, to tarry awhile and ponder over what the book under review contains of information upon a matter which has been the subject of grave discussion in our own correspondence columns lately. This is the sorry plight into which British agriculture has been allowed to lapse during the period intervening between the last great war and the present war. It would be difficult to visualise a fairer exposition of this problem than is presented by Mr. Nettell. What the sad neglect of the countryside, to pander to the more immediate needs and the covetousness of industrialism, capitalism and urbanisation, has meant in suffering to the farmer and his farmhands through inability to obtain remunerative prices for his products caused by admission of cheap imported

foodstuffs to bolster up a large export trade, to provide sustenance for an increasing urban population; what all this has implied in moral and physical decay of the general population, through a healthy rural population with a possessive interest in their labours deserting the land to live the more easy and apparently—and only too alluringly apparently—more remunerative and pleasure-seeking lives of the town and city, is told in words that are made to fall from the mouths of ordinary people with an effect that no text-book on agricultural economics or recent political history could so readily convey to the ordinary reader. Among the tragedies which beset the farmer who occupies the central position in the story told by the author is a realistic and sufficiently accurate account of an outbreak of foot-and-mouth disease and the terrible dislocation caused by the necessary system of controlling it. One of the great merits of the British farming public, beyond their transparent honesty as a class, has been that they have submitted in the common interest to this rigorous system of veterinary official control.

We would like to add that in all that the Association of which this journal is the mouthpiece has done in recent years, whether in advocating a proper system of veterinary education to comply with the needs of the farmer or otherwise, by pressing forward measures to prevent his heavy losses from disease, it is hoped that the fullest practical support and sympathy has been shown to the farming community—from which only, in any country, a really virile and healthy-minded population can be drafted. The pity of it that, with perhaps only one exception, no great statesman (who has indeed cried in the wilderness) has appeared in recent times to grasp this problem, in its widest implications!

DISGUISING GREY PONIES IN DRY CLIMATES

Mr. F. Peck, Chief Veterinary and Agricultural Officer, Somaliland Protectorate, writing from Burao on June 26th, draws attention to the fact that in dry climates, where it is expedient to disguise grey ponies against aircraft, potassium permanganese in strong solution—the method originated by Captain O. G. Brooke, of the Somaliland Camel Corps—is very effective. In wet weather, however, the colour gradually washes out and it may be that a better and more permanent method is known: "If this should be so" (writes Mr. Peck), "I would be very interested to hear of it."

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RECORD CATTLE POPULATION

Our cattle population is to-day greater than it has ever been before. This increase on last year's record figure of 6,762,000 has been achieved in spite of the fact that over 2,000,000 acres of pasture have been ploughed out. This total includes an increase in the number of dairy cattle which last year were returned at something like 3,000,000.

Sheep (last year 18,000,000) have been well maintained, and although the pig and poultry populations have been reduced, the reduction has not been so great as was anticipated.—*Farmers' Weekly.*

* * * * *

Chillingham Wild Cattle Association, Ltd., formed last year for the protection of the famous herd of wild white cattle, has had a successful year, but circumstances arising from the war have caused the Council much anxiety. At the annual meeting Sir Charles Trevelyan, Vice-President, appealed to the public to help to keep the Association going and the herd alive.

ABSTRACTS

[INCO-ORDINATION OF EQUIDAE: WOBBLERS. Dimock, W. W., and Errington, B. J. (1939.) *J. Amer. vet. med. Ass.* **95**. 261. (9 figs., 2 refs.).]

The report is of work in Kentucky and covers a period of two years during which 47 "wobblers" were observed, *post-mortem* examination being carried out in 30 instances. The condition is noted more frequently in thoroughbreds than in other types. The age incidence is from three months to two years, and the 47 cases under review were made up of 38 colts and nine fillies.

The condition develops suddenly and there is marked variation in the severity of the symptoms which are always bilateral in character. The hind limbs are generally first affected but in advanced cases the condition extends to all four legs. The neck is carried stiffly and pain is shown when it is moved laterally.

The important *post-mortem* findings were osteo-arthritic changes in the cervical region of the vertebral column and deformity of the articular processes. There was diminution in the calibre of the spinal canal and also of the foramina. Degenerative changes were found in the cervical spinal cord and in the cervical nerves. Similar but less extensive changes were noted in other parts of the spinal cord.

J. W. H. H.

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[COAL TAR PITCH POISONING IN PIGS. Graham, R., Hester, H. R., and Henderson, J. A. (1940.) *J. Amer. vet. med. Ass.* **96**. 135.]

The authors describe an unusual disease of young pigs characterised by the degeneration of the liver. Four separate outbreaks are recorded and the evidence submitted suggests poisoning by coal tar pitch.

The affected pigs show symptoms of inappetence, dullness, rough coat, tucked-up abdomen, and weakness with death in a few hours. Young pigs of ages from six to 20 weeks were mainly affected whilst adults in the same herds remained normal.

The most characteristic lesion at *post-mortem* examination was found in the liver which had a red or yellow mottled appearance, affecting the whole organ in severe cases. Microscopically, these lesions proved to be a central necrosis of the hepatic lobules. Other *post-mortem* findings were: jaundice of the subcutaneous tissues, oedema and marginal congestion of the lymph nodes with a straw-coloured liquid in the abdominal cavity.

Bacteriological examination proved negative and a survey of the pastures and feeding material failed to reveal any plant or fodder poison. However, it was definitely established in two of the four outbreaks that the pigs had access, whilst at pasture, to the remains of clay pigeons used by local gun clubs. These clay pigeons were found to be composed of coal tar pitch and powder limestone with a protective covering of calcimine.

Group feeding experiments were carried out using the powder remains of the clay pigeons, commercial coal tar pitch and lead shot. Details of these experiments are given in the article. Those experimental pigs fed on diets containing the powdered clay pigeons and the commercial coal tar pitch showed identical

symptoms and lesions to those exhibited by the naturally affected pigs. Lead shot failed to produce any liver lesions and copper was excluded as a possible exciting factor. The authors consider coal tar pitch to be a possible cause of the outbreaks, but as yet do not know the incriminating ingredient or ingredients. The chemical composition of coal tar is tabulated in the article.

J. B. T.

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[**IS LEUCAEMIA A NEW GROWTH?** Annot. *Brit. med. J.*, December 9th, 1939. 1147-1148.]

Recent study on the leucaemias in man, animals and birds is tending to show that a close relationship exists between this condition and tumours of the lympho-sarcoma type. Every transition from classical leucaemia to tumours such as chloroma and lympho-sarcoma has been observed and the metabolism of leucaemia cells and the morphological abnormalities they show are identical with those of neoplastic tissues. This conception of leucaemia, which results from clinical observation, is supplemented by observations on experimental animals. A close study of the condition in the fowl and the mouse appears to show that the predisposing factors are heredity, external environmental factors (irritation), and a virus. The heredity factor has been studied in human families, in a number of which leucaemia has been observed to occur in near relatives. Experimentally, pure strains of mice have been bred in which the spontaneous incidence of leucaemia reaches 90 per cent. while in other strains leucaemia has been bred out so that its incidence is little over 1 per cent. External agents known to produce or to increase the incidence of leucaemia in animals are radium and X-rays, tar, and the carcinogenic hydrocarbons. This has been shown beyond doubt, in experiments on mice in which after roentgen irradiation the incidence of leucaemia rose from 2 to 20 per cent. The study of human cases tends to show that a higher incidence of leucaemia occurs amongst men and women whose occupations repeatedly expose them to radiation, *e.g.* radiologists. In fowls many of the spontaneous leucaemias can be transmitted to healthy birds by cell-free filtrates. Furthermore, several investigators have pointed out that certain leucaemic strains in fowls can produce both leucaemia and sarcoma, depending on the mode of injection of the cell-free filtrate. Although leucaemia in mice can be implanted from one animal to another it cannot be transmitted by a cell-free filtrate, but recent experiments suggest that cell-free transmission is not beyond the bounds of possibility and that there is no fundamental difference between leucaemia in birds and in mammals.

E. I. T.

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[**OBSERVATIONS ON THE LIFE-HISTORY OF *BUNOSTOMUM TRIGONOCEPHALUM*, A HOOKWORM OF SHEEP AND GOATS.** Ortlepp, R. J. (1939.) *Onderstepoort J.* **12**. 2. 305-318.]

Ortlepp, in 1937, briefly outlined the salient features of the parasitic stages in the life history of *Bunostomum trigonocephalum*, an important hookworm parasite of sheep and goats not only in South Africa, but also in the British Isles and many other parts of the world. In this paper the author deals at greater length and in greater detail with his observations on the life cycle of the nematode. From experimental evidence it was found that eggs, either passed in the faeces of sheep or goats or obtained from the uteri of gravid females, hatch in from 24 to 36 hours under suitable conditions of temperature (26° C.), moisture and aeration. The first stage larva, which emerges, passes through the second stage and reaches the third, infective stage in five to eight days after hatching. The cuticle of the second stage is retained as a protective sheath for the infective stage. Morphologically and biologically the different larvae are practically identical with those of *Gaigeria pachyscelis*, another hookworm which occurs in Africa in sheep and goats and with which Ortlepp has dealt in detail (*Onderstepoort. J.* **8.** 183-212). Infective larvae can set up an infection either *via* the mouth or through the skin. When applied to the skin, they penetrate it and presumably enter a blood vessel and are then carried, *via* the blood stream, to the lungs, which they reach within six days. In this organ they remain for about five days during which period they grow and pass into the next or fourth stage which is provided with a provisional buccal capsule. These larvae now undergo an ecdysis and presumably migrate up the trachea to the mouth and are then swallowed and reach the intestine, from the eleventh day onwards, as young fourth-stage larvae. When first seen in the intestine no sex differentiation is evident ; this sets in about four days later, when buccal lancets also appear. The larvae attach themselves to the intestinal villi, feed on the liberated blood and grow and begin to pass into the final stage in about a week after reaching the intestine, that is in about three weeks after infection. Four weeks after the infection the adult stage is completed but the larvae are still enclosed in the cuticle of the previous or fourth stage. During the fifth week the cuticle is shed and the emerging forms from now onward continue to feed and grow until the ninth or tenth week, when they are fully mature and the females contain segmenting eggs.

J. N. O.

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[**FAT METABOLISM IN THE ANIMAL BODY.** Smith, J. A. B. (1939.) *Chem. and Ind.* **58**. 213-220. (3 tables, 5 figs.).]

This lecture provides a valuable review of many aspects of modern knowledge of the subject ; some of its salient features may be noted under the sub-headings of the original.

The Chemistry of the Fats.—Certain fatty acid mixtures have been shown to be characteristic of different groups of animals, and the more primitive the form of life, the more complex these mixtures appear to be. Thus the higher unsaturated C_{20} and C_{22} acids are present in large quantities in the fat of fish, to a much lesser degree in the fat of reptiles, and are almost, if not entirely, absent from the fat depôts of the ox, pig and other mammals. (In the ox, however, as much as 40 per cent. of these acids may be present in the fatty acids of whole blood, and they have also been found in the liver of higher mammals). A recent analysis of ox fat indicates the great variation in glyceride structure not only theoretically possible but actually occurring.

The Digestion and Absorption of Fats.—Verzar has shown, by injecting different preparations of olive oil into a dog's intestine, that neither fats in fine

emulsion nor fatty acids alone, nor fat emulsified with bile can be absorbed, but that conversion of the fat to fatty acids and the presence of bile-salts are essential. Accurate *p*H measurements indicate that the formation of water-soluble soaps of stearic, palmitic and oleic acids (the form in which they were once believed to be absorbed) does not take place within the range 6·2 to 8·0 commonly found in the small intestine. Water-soluble complexes of bile-salts and fatty acids do, however, exist within this *p*H range. There is much evidence to indicate that the fatty acids are absorbed as a part of these complexes, that the bile salts are then liberated, and that conversion of the fatty acids to a phosphorylated compound, probably lecithin, takes place within the cells of the intestinal mucosa: much of the lecithin is then converted to neutral triglycerides.

Transport of Fat.—Whereas the greater part of the fat of lymph is present as ordinary triglycerides, there are relatively greater amounts of phosphatides and cholesteryl esters present in plasma. By feeding iodized fat to cows, it has been shown that a small but definite proportion of the dietary fat appears in the phosphatide fraction of the blood, and this is also true of the non-ruminant.

The Deposition of Fat.—Experiments using fats "labelled" with deuterium have indicated that the bulk of the dietary fat passes directly to the storage depôts before being used for other purposes. There are various factors, including the power of the animal to synthesize fat, which tend to maintain the composition of the depôt fat constant. The relationship of temperature and actual position of storage to the type of fat in the depôts has been shown by studies of the composition at different depths of the subcutaneous layers on an animal's body; it appears that where the temperature is relatively low the fat is less saturated in order to avoid the risk of solidification.

Deposition in the Liver.—The normal 3 to 4 per cent. content of rats' livers can be raised to 30 per cent. or more by feeding a diet rich in fat, poor in protein, and from which choline is absent. The feeding of even traces of choline will both cure and prevent this abnormal accumulation of fat, and choline is said to possess a "lipotrophic action." Increasing the protein in the diet also prevents the development of fatty livers.

Fat Synthesis.—The ability of the animal body to synthesize fat from carbohydrate, first demonstrated by Lawes and Gilbert's now classical experiment on pigs, has recently received interesting confirmation from the work of Schoenheimer and his colleagues, who kept mice on a diet of carbohydrate and water containing heavy hydrogen: they found that the deuterium soon appeared in both the saturated and the unsaturated fatty acid molecules of the body. Once fatty acids have been formed, the body can readily form fats through its widely-distributed lipases, which catalyse the esterification as well as the hydrolysis of fats.

The Catabolism of Fats.—There is much evidence in favour of the β-oxidation of fats, but modern experiments necessitate a modification of the original hypothesis; it now seems as if oxidation of alternate carbon atoms takes place along the whole chain. The discovery of the so-called ω-oxidation of the terminal carbon atom is important.

A. N. W.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

* * * * *

PERSONAL

Birth.—On September 10th, at Courtlands Farm, Coolham, Horsham, Sussex, to Mary (*née* Patten), wife of John Pasfield, M.R.C.V.S., a son, Jonathan. Both doing well.

* * * * *

COLONIAL OFFICE APPOINTMENTS

The Secretary of State for the Colonies has appointed Dr. H. A. Tempany to be his Agricultural Adviser in succession to Sir Frank Stockdale, who has been appointed Comptroller for Development and Welfare in the West Indies. Dr. Tempany has been Assistant Agricultural Adviser to the Secretary of State for the Colonies since July, 1936.

Education in the Colonies

Two important educational appointments in the Colonies have just been made by Lord Lloyd, the Secretary of State for the Colonies—Dr. Ivor Jenning to be Principal of the University College of Ceylon, and Mr. Stanley A. A. Hammond to be Educational Adviser on the West Indian Comptroller's staff. These appointments are in further implementation of the policy of Colonial Development and Welfare, as announced in the White Paper published last February.

* * * * *

DOMESTIC POULTRY KEEPING: ADVISORY COUNCIL APPOINTED

The Minister of Agriculture has appointed a Domestic Poultry Keepers' Council "to guide and assist domestic poultry keeping in war-time with special reference to securing the effective use of household and garden waste and organising available supplies of purchased feeding stuffs."

The membership of the Council is: Mr. Tom Williams (Parliamentary Secretary to the Ministry of Agriculture), Miss Megan Lloyd George, M.P., Sir D. Gunston, M.P., Captain G. Clifford (President, National Poultry Council), Captain S. W. Clift (Chairman, War Emergency Committee of the National Poultry Council, and Chairman, Poultry Committee of the Bingley Council), Dr. Charles Crowther (Principal, Harper Adams Agricultural College), Mr. W. Powell-Owen (President, Poultry Club), Dr. J. M. Newnham, Mr. T. A. Stevens, and Miss F. Garrett. The Secretary is Mr. R. A. Hughes, to whom all communications should be addressed at 55, Whitehall, S.W.1.

* * * * *

THE NATIONAL MILK SCHEME

The Ministry of Food states that the National Milk Scheme is still progressing steadily, and applications are being granted at the rate of about 15,000 daily. The number of beneficiaries in Great Britain and Northern Ireland at the end of August was 2,487,939, out of a possible total of about 3,911,000. The response is still best in England and Wales, and the highest of all is in London. Of those who receive milk under the scheme, 27 per cent. get it free in England and Wales, 46 per cent. in Scotland, and 75 per cent. in Northern Ireland.

MINISTRY OF AGRICULTURE NEWS SERVICE

500,000 *Tons of Swill from Household Waste.*—The feeding stuffs which pig and poultry keepers normally use will be short in the autumn. The herds of pigs and flocks of poultry dependent on those feeding stuffs may have to be reduced to one-third of their pre-war level. So the Minister has urged stock-keepers to secure and make good use of the thousands of tons of good stock food represented by waste material from households, hotels, institutions, canteens and Service Establishments. It is estimated that about 500,000 tons of waste food or swill could be collected each year, largely from private households. A large number of pigs and poultry could be kept on this food waste with the aid of the reduced supply of purchased feeding stuffs which will be available.

Many local authorities are already collecting food waste for stock-keepers. Much of this material is sold to them in its raw state, but methods of treatment are also developing which include simple boiling, semi-drying or concentration, and complete drying and milling which makes the product suitable for inclusion as a major ingredient of a ration sold in balanced form. Most of the swill collected from private households and similar sources will probably be sold in its original condition. As such it will have a fairly high moisture content (70 to 80 per cent.), but its composition will naturally vary according to the time of year and the types of human food of which it forms the waste. Where semi-drying or concentrating is resorted to, the moisture content is likely to be reduced to about 50 to 55 per cent., the product being in the nature of a stiff paste or porridge, very much reduced in bulk and capable of being kept for a week without undue deterioration. Complete drying, which is being adopted in some of the larger centres of population where suitable plant is available, gives a product of about 10 to 13 per cent. moisture comparable in dryness with other feeding meals. This dried food waste is made available in balanced form and not as " dried swill."

Some farmers, although aware of the feeding value of swill, are reluctant to use it in case their stock contracts swine fever or foot-and-mouth disease. If swill is properly boiled for at least one hour as required by law, this danger is removed and the material can be fed with safety. Where the swill is concentrated or dried, and sterilisation is achieved during the process, the product can be sold under licence exempting the material from the necessity of boiling.

Although a great deal is already being done to arrange for the collection of household food waste in many parts of the country, this reservoir of feeding material cannot be fully utilised without the ready co-operation of stock-keepers. It is natural, of course, that many without previous experience of swill should be chary of using it, but when it is realised that the material is of surprisingly high feeding value and that it is not difficult to render it safe, there is little doubt that the demand for swill will more than keep pace with the supply. The Minister of Agriculture has recently requested County War Agricultural Executive Committees to give the matter of swill utilisation their immediate consideration, and the Committees for the more populous counties have been asked to appoint an officer specially for this work. It is hoped that stock-keepers will take advantage of this opportunity to supplement their supply of normal feeding stuffs and, with a realisation of the nature and value of swill, will assist their War Agricultural Executive Committees by making known their requirements.

When Farmers Keep More Cows: Milk Producers' Urgent Requirements Will Come First.—Weather conditions that have been helpful to harvest are proving a mixed blessing to stock-keeping, but it is not too late for rain to bring a good flush of short grass from the warm soil. With increasing demands upon shipping, the need for farmers to make as much silage as they can for this winter is vital. It is evident, however, that this must be fitted in with the general economy of the farm and silage must be balanced with grazing and other requirements, such as ploughing up.

Some farmers have increased their dairy herds and cut down their pigs and poultry. They should be able to adjust their supplies of feeding stuffs with their merchants. The distributors have been told to carry out the priorities announced by the Ministry, and to put the milk supply first.

Other farmers have taken over derelict land and are stocking it with dairy cows. They also should be able to obtain their urgent requirements from their merchants. If a merchant finds that the amounts involved are substantial and more than he can manage, he should apply to the Executive Officer of his Animal Feeding Stuffs Division.

Straw for Feeding.—Straw must be used with care this winter and waste avoided wherever possible. Straw, either long or chaffed, will have to be included in most animal rations. In such cases it is best to start using a proportion of straw at the outset of winter feeding rather than feed all hay until stocks are used up and then have to replace it entirely by straw. Loose straw is less easy to handle and more wasteful than bales or trusses. Littering of large yards can probably be done most easily with loose straw but for small yards and for stock in buildings, loose boxes, etc., trusses are usually easier to handle. It is also easier to exercise proper control over the quantities used, whether for litter or for feeding long, if the straw is baled or trussed. These advantages more than outweigh the extra cost of trussing. Trussing behind the threshing machine is more common now than it used to be, and where a trussing machine is available farmers would generally be well advised to take advantage of it. If straw is to be kept for any length of time, it should, of course, be made into a proper stack, not just a " heap," and the stack should be protected from the weather by a rough thatch.

Woodlands' Harvest: Acorns, Chestnuts and Beech Mast to Help Out the Rations.—Acorns, horse chestnuts and beech mast can all contribute to feeding stuffs' supplies, but they must be used with care. Acorns contain a considerable amount of starchy material; so do horse chestnuts, together with a small amount of sugar. Not much is known about the composition of beech mast, but the kernels are rich in oil and flesh forming material. Generally speaking, it is advisable to feed only the kernels, for the husks are very fibrous.

Acorns should never be fed in any form to cattle. Pigs running out may be allowed to gather up the fallen fruits, but it is undesirable to turn out pigs reared indoors to gorge themselves. The usual ration for indoor pigs is up to 1 lb. per head per day, while suckling sows may receive up to 3 lb. They are best not fed at all to pregnant sows. They have a binding tendency and should be accompanied by ample supplies of water or succulent green food. Fattening sheep may be given up to ½ lb. of acorn meal per day in the concentrate part of the ration.

Horse chestnuts are also somewhat astringent and, if unaccompanied by water and laxative foods, have been known to cause digestive upsets, particularly stoppage. The addition of salt is reputed to prevent this and it also adds to their palatability. When used properly there need be no fear that they are poisonous. Raw chestnut should be introduced cautiously at first and increased gradually. They replace a cereal, 1 lb. being equal to about ½ lb. of oats or barley. Mouldy nuts should not be fed. Where large quantities are available, it is an undoubted advantage to dry them and reduce them to a meal. On a small scale this might be done in an oven. A little molasses mixed with the meal masks the bitter flavour and counteracts the binding effect.

Beech mast must never be fed to horses, for serious and even fatal symptoms may result. Beech mast, hulled and ground, may be fed in moderate quantities to older fattening pigs, gradually introduced into the ration. Ample supplies of drinking water should be available. Pigs should not be allowed sudden access to beech woods after the nuts have fallen or they may eat too greedily, especially when grass is scarce. They should be gradually accustomed to the nuts. But if they were already running out

and accustomed to an omnivorous diet, the few nuts that fell first will probably inure them to the later glut. Beech mast kernels have also been fed with safety in small amounts to fattening cattle.

Organising the collection of these woodland feeding stuffs will not be easy in some districts, but local school-children will often be able to overcome this difficulty. In certain districts they have collected acorns for the Forestry Commission in recent years and the Board of Education have given their co-operation, both in the last war and last autumn.

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MINISTRY OF AGRICULTURE'S CROPPING POLICY FOR 1941

The Minister of Agriculture has now given a clear indication to the County War Agricultural Executive Committees of the general lines on which the food production campaign should be intensified for 1941. He has pointed out that more food can be produced from an acre of arable than an acre of grassland. The Committees have practically completed their survey and arrangements for additional grassland to be ploughed and cropped for next year are well in hand. The Minister has reminded the Committees that the milk supply must be maintained and is more likely to be limited by shortage of winter foods than by shortage of summer grass. The dairy farmer's best safeguard for the winter of 1941-42 is, therefore, to grow enough oats, roots, kale, etc., to provide for all cows-in-milk and in-calf. Winter fodder should also be grown for horses, young heifers and other essentials. Summer grazing will be needed for the farm's dairy herd, but permanent pasture suitable for ploughing should no longer be reserved for sheep and store stock.

Farmers have already been advised to plant wheat and beans on all suitable land. The Minister has now asked for an increase in the potato acreage in almost every county. Steps are being taken to ensure that there is a sufficient supply of sound seed—the price of which will be controlled. The Committees have been asked to ensure that at least as much sugar beet as was grown in 1939 is sown, and spring oats and barley are required on suitable land with due regard to the importance of making farms as nearly as possible self-supporting in winter keep. Crops for seed of grasses, white clover, roots and vegetables are all of national importance. Flax will be needed again next year and farmers will be offered contracts under the Ministry of Supply's scheme. While farmers will still be allowed reasonable latitude in the choice of the crops they will grow, the Minister stresses that the production of direct human food stuffs, like wheat and potatoes, and also of winter feeding stuffs for dairy cows, is most important. As an essential to the attainment of the Government's objective the Minister has called on each farmer to regard himself as the willing manager of his land for the national good.

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Mr. James Gray Stuart, M.P., and Sir W. Wilson Jameson, Dean of the London School of Hygiene and Tropical Medicine, have been appointed to be members of the Medical Research Council by an order of the Committee of the Privy Council.

* * * * *

The Danish and German authorities in Copenhagen have jointly decided immediately to reduce the pigs and poultry of Denmark by half because of the difficulty of obtaining feeding stuffs. There will thus be slaughtered 1,500,000 pigs and 7,000,000 hens, as well as 150,000 milch cows and 200,000 heifers.

Almost the whole of this meat will go to Germany.

* * * * *

Mr. Robert Boothby, Parliamentary Secretary to the Ministry of Food, in reply to a deputation from the Central Council for Health Education, which urged that the Minister should officially advise the public that all milk not designated as pasteurised or tuberculin-tested should be scalded before use, promised careful consideration of representations.

OESTROGENS

A recent note in the *Lancet* (March 9th, 1940) dealing with the risks attending the administration of oestrogens, comments that the synthesis by Dodds and his colleagues[1] of a new oestrogenic substance, diethylstilboestrol, has placed a powerful agent in our hands. The natural oestrogens (*i.e.*, those obtained from human pregnancy urine, *e.g.*, oestrone) were expensive and had to be injected to be fully effective. The synthetic compound is cheap and can satisfactorily be taken by the mouth. Clinical trials of stilboestrol were favourable in this country[2 3 4], though it appeared to cause vomiting in a small proportion of cases, and the Therapeutic Trials Committee released it for general distribution. Shorr, Robinson and Papanicolaou[5] in America, however, have met with toxic effects in four-fifths of their 44 cases. Buxton and Engle[6] also report slight toxic effects. MacBryde and his colleagues[7] have confirmed the low incidence and transitory nature of the toxic effects. In view of these and other conflicting findings in America, the Council on Pharmacy and Chemistry decided not to recognise the substance for general use until further experimental studies have been made. In this country, continues the *Lancet*, recent experience in several hospitals where stilboestrol has been extensively used does not reveal a high proportion of unpleasant effects, and there is no evidence that permanent damage has been caused by the drug. Commenting on the more remote risks of oestrogen therapy, the *Lancet* proceeds, many warnings have been given of the dangers of carcinoma following prolonged oestrogen administration; although there seems to be no conclusive evidence that this has occurred, yet oestrogens should certainly not be given when a carcinoma of the breast or cervix is already present. Some fear, states the *Lancet*, the uncontrolled use of oestrogens as contraceptives and abortifacients and as aphrodisiacs. Again, there is an increasing volume of experimental evidence that oestrogens produce changes in many structures of the body other than the sex organs, though there seems little danger in man of the formation of pituitary tumours such as are seen in small animals after treatment with them[8].

[Diethylstilboestrol is a white crystalline substance, easily soluble in alcohol, and has a melting point of 171° C. By vaginal smear assay on ovariectomised rats it has been found to be about two and a half times as active as oestrone and, moreover, is highly effective when given by the mouth. In human medicine it has been used with success in post-menopausal disorders, dysmenorrhoea, atrophic conditions of the vagina and hypoplasia of the uterus. Parkes, Dodds and Noble (1938) (*Brit. med. J.* **2.** 557) have shown that oral administration causes interruption of pregnancy in experimental animals In this connection it is interesting to note that Folley and Watson (1939) (*Lancet*, **237.** 788) produced abortion in two out of four pregnant cows by inunction of the udder with an ointment containing stilboestrol dipropionate.

On account of its relative cheapness diethylstilboestrol can replace natural oestrogens in veterinary practice, particularly in ovarian disorders of dogs. There should be very little immediate or remote risk since the drug need never be used over a prolonged period.]

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Contents

PAGE

GENERAL ARTICLES:

Some Properties of the Trichloracetic Acid Extract of *Br. abortus*, with special reference to Immunisation ... ... F. W. PRIESTLEY 699

An Automatic Switch for Electric Centrifuges A. LESLIE SHEATHER 703

ANNOTATION:

The Treatment of War Wounds ... J. G. W. 704

ABSTRACTS:

Anastomosis of the Intestine (Stewart, G. M.) C. F. 705

A Comparison between the Methylene Blue Reduction Test and the Plate Count with Changing Conditions of Milk Production and with Changing Conditions of Storage of the Milk Samples before Testing (Nichols, A. A., and Jackson, C. J.) ... ... S. J. E. 706

Tuberculous Synovitis in Bovines resulting from the Intravenous Injection of Avian Tubercle Bacilli (Crawford, A. B., and Frank, A. H.) A. E. K. 706

Some Observations on Anaesthesia in Sheep. I.—Comparative Value of Chloral Hydrate and of Ethobutyl-Ethyl-Malonate (Levi, M.) A. E. K. 706

PAGE

REVIEW:

Science in War (Scientists' Symposium, published in the "Penguin Special" Series) 706

NOTES AND NEWS:

Animals' Reactions to War 702

Diary of Events 707

The N.V.M.A. and the London Raids 707

The National A.R.P. for Animals Committee ... 707

Personal 708

War Damage to Property 708

Casualty Livestock 708

Foot-and-Mouth Disease in Yorkshire 708

Costly Drugs and the Purchase Tax 708

A Rational Approach to Research in Chemotherapy ... ... PAUL FILDES 708

CORRESPONDENCE:

Etiology of Equine Specific Ophthalmia WAKEFIELD RAINEY 710

Injured Teats in Cows ... F.R.C.V.S. 710

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